

to their palaeoenvironmental interpretation. To this end, a collection of short papers is provided, grouped by geological period. Unfortunately, this results in a most unsatisfactory volume; the goals may have been laudable, but the product is a disappointment. Although the editors, Elizabeth Gierlowski-Kordesch and Kerry Kelts, emphasize the importance of multidisciplinary approaches to investigate the 'unified lattice' which makes up limnogeological records, they have apparently been unable to instil their contributors with this breadth of vision. Even the group of seven papers which make up the initial 'Selected Topics' section shows no coherency of theme or consistency of style; Colin's paper is a list, Simon-Coincon's a collection of tables. Amongst the remaining papers, the separation by time period neither achieves the goal of providing regional time slices, which might aid palaeoclimatic interpretation, nor allows the long-term evolution of lake basins within a region to be appreciated. For example, the paper by Anadon, in the Paleocene-Eocene chapter, on the eastern Ebro basin in northeast Spain is not cross-referenced to the later paper (in the Miocene-Pliocene chapter) by the same author on the western Ebro basin. Even more extraordinary is the fact that the seven papers on lake deposits in Spain in the Miocene-Pliocene chapter appear to have

been written in complete isolation, with no attempt being made to explore the overall significance of these deposits. Some of the papers provided are remarkably short, with little to offer by way of conclusions or discussion of their significance. It is quite clear that in some cases vast amounts of data have undergone unreasonable compression.

One of the points made by the editors in their introduction is that the study of lake systems by limnologists and geologists has often gone on in isolation, to the detriment of the work of both groups. It is perhaps surprising, therefore, to find that more than 70 per cent of the contributors to the volume come from Geology or Earth sciences departments. Only one person (Kerry Kelts) indicates a limnological affiliation. In far too many cases it is clear that geologists have not talked to anyone else. Although there is obvious scope for later volumes in the series to address some of the real issues that the IGCP projects have set out to tackle, given the cost, I would rather have had the money than a copy of volume 1.

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FORMS ET MOUVEMENTS DE LA TERRE: SATELLITES ET GEODESIE by Anny Cazenave and Kurt Feigl, CNRS Editions, Paris, 1994. No. of pages: 160. ISBN 2-271-05233-5.

The ever-changing shape of the Earth reflects the combined effect of inherent and extrinsic gravitational forces acting on deformable materials. Unravelling the signal contained in the geoid or gravitational field therefore provides a wealth of information on how and why the Earth's surface and interior deform. Our age has witnessed tremendous developments in geodesy. Even 25 years ago, a position on the ground could only be located with a precision of around a metre; today the Global Positioning System (GPS) offers centimetric precision—a 100-fold improvement. The principles behind the new space techniques, and some of the key geoscience results they have provided, are the subject of this book.

Following the introductory chapter is a review of plate tectonics and mantle convection, while Chapters 3 and 4 illustrate how these processes are manifested in the geoid as measured by satellite radar altimetry. Chapters 5 and 6 describe in straightforward terms the basics of Very Long Baseline Interferometry (VLBI), Global Positioning System (GPS) survey, and Synthetic Aperture Radar (SAR) interferometry, as applied to measurements of crustal deformation. Of particular note is the fact that

this must be one of the first books providing a treatment of the latter technique, drawing on recently published analyses of co- and post-seismic displacement in California, and glacier motion in Antarctica, made possible by European Resources Satellite (ERS-1) imagery.

Chapter 7 looks at the varying length of the day—how it is measured (by laser ranging to satellites covered in reflectors) and its consequences for the atmosphere. The remaining four chapters are short, superficial treatments of laser telemetry and satellite altimetry for observing Earth tides, ocean circulation, and glacial rebound, and there is even brief mention of the geology, topography and gravity field of Venus as observed by the Magellan spacecraft.

Overall, technique and application receive roughly equal treatment, though there is an emphasis on global and regional rather than local scale measurements. The style and level of presentation is reminiscent of *Scientific American* articles: there are abundant graphs, maps, diagrams, colour images and 'boxes', and virtually no equations. Those who wish to delve deeper will find the bibliography provides good inroads into the recent literature. This is a very sound elementary text on a fascinating subject.

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